OIPE MAR 15 2006 PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS	:	Michael Maguire
TITLE	:	SYSTEM AND METHOD FOR ABBREVIATING INFORMATION SENT TO A VIEWING DEVICE
SERIAL NO.	:	09/624,285
FILING DATE	:	July 24, 2000
EXAMINER	:	Stork, Kyle R.
GROUP ART UNIT	:	2178
ATTORNEY DOCKET NO.	:	555255012115

Declaration of Prior Invention to Overcome Cited Patents Under 37 C.F.R. § 1.131

Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

This Declaration is submitted by the undersigned inventor to establish that the subject matter described and claimed in this application was invented prior to May 18, 2000, which is the filing date of US 6,593,944 to Nicolas ("Nicolas").

I, Michael Maguire, the inventor of United States Patent Application S/N 09/624,285, titled "System and Method for Abbreviating Information Sent to a Viewing Device" declare as follows:

1. Prior to May 18, 2000, I conceived of the subject matter described and claimed in the above-titled patent application. Evidence of this conception is set forth at Tabs A, B and C

hereto. The document at Tab A is an invention disclosure form that I completed well before May 18, 2000. The invention disclosure form is titled "Graphical Abbreviation of Structured Information for Small Browsers." This document was provided to the assignee's outside patent counsel prior to May 18, 2000 in order to prepare the above titled patent application. On information and belief, the outside patent counsel prepared a first draft of the patent application prior to May 18, 2000, which document is attached hereto at Tab B. The patent application at Tab B included five drawing figures of my invention. The five drawing figures are attached hereto at Tab C, along with an invoice from the drafting service that generated the drawing figures dated May 12, 2000. On information and belief this invoice relates to the five drawings of my invention set forth at Tab C, which are the same drawings submitted with this patent application.

The following table links the disclosure of the documents at Tabs A, B and C with the claimed subject matter of this application, clearly demonstrating conception of the claimed invention prior to May 18, 2000.

Claim	Support
22. A method of providing an information page to a handheld viewing device, comprising the steps of: requesting an information page at the handheld viewing device; retrieving the information page from a remote system; if the information page includes a plurality of frames, then generating an abbreviated version of the information page, wherein the abbreviated version includes a graphical representation of the information page and an image map that identifies the locations of the plurality of frames within the graphical representation of the information page; and	[Tab A] The invention disclosure form at Tab A describes this method in detail. Under the "Description of Invention" section of the document, the method is described for previewing content on a browser with a display which is too small to accurately display the entire document. Specifically, this section describes how HTML frames on a browser are displayed by showing a "graphical abbreviation" of the whole page and then by selecting one of the frames using an input mechanism on the device. Section 9 of the invention disclosure form describes the method in more detail, indicating that after a user selects an URL (Uniform Resource Locator) on the device, which corresponds to the requesting and retrieving steps, the URL referring to a sample page on the remote system "rim.net," the system then loads the requested document and generates a reduced image or "graphical abbreviation" of the page. Framed web pages are dealt with as follows: "In the case of a document with sub-areas such

transmitting the abbreviated version of the information page to the handheld viewing device.	as an HTML document with HTML frames, the next step would be to generate an image map to be associated with the bitmap. This image map would define a set of selection areas which would be high-lighted when the user used the selection mechanism on the device to choose which frame to view. The final steps would be to send this reduced image – in some cases along with the image map information – to the device and to allow the user to chose whether to view the document or whether to view a part of the document." (Tab A, Section 9) Another example of retrieving a graphical abbreviation and associated image map from a remote system is described in the invention disclosure form at pages 9-12, with respect to the remote system www.geocities.com. [Tab B] The draft patent application at Tab B describes this method in detail, for example at pages 4-5; and at pages 8-10 in conjunction with Figures 3 and 4 of Tab C. [Tab C] Figures 3 and 4 of Tab C graphically depict this method in detail, including the steps of requesting an information page at the handheld viewing device (52); downloading the requested page from a remote server (54); determining if the information page has frames (56); generating a bitmap image of the requested framed page (72); generating an image map of the framed page (80); and transmitting the bitmap and the image map to the handheld viewing device (82).
23. The method of claim 22, further comprising the steps of: providing a gateway device for receiving the request from the handheld viewing device and for retrieving the information page from the remote system.	[Tabs B/C] The draft patent application and drawings associated therewith describe a gateway device for receiving the information request and for retrieving the information page from the remote system. (See, for example, page 4 of Tab B which describes a "gateway device," and pages 6-10 of Tab B which describe the "gateway device" as a "web proxy server" for retrieving the requested information page; see also Figure 2, item 24, which is the claimed "gateway device."

24. The method of claim 23, further comprising the steps of: coupling the gateway device to the handheld viewing device via a wireless network.	[Tabs B/C] Figure 2 of the draft patent application, and associated description thereof at Tab B, shows the gateway device 24 coupled to the handheld viewing device 28 via a wireless network 30.
25. The method of claim 23, further comprising the steps of: coupling the gateway device to the remote system via a wired network.	[Tabs B/C] Figure 2 of the draft patent application, and associated description thereof at Tab B, shows the gateway device 24 coupled to the remote system 22 via a wired network (Internet).
26. The method of claim 25, wherein the wired network is the Internet, and the remote system is a world-wide-web server.	[Tab A] The invention disclosure form at Tab A describes a method of retrieving pages over the internet from two different remote WWW servers, www.rim.net and www.geocities.net. The web pages are also graphically depicted in the invention disclosure form. [Tabs B/C] Figure 2 of the draft patent application, and associated description thereof at Tab B, shows the wired network as the Internet, and the remote systems as WWW servers 22.
27. The method of claim 26, wherein the information page is a web page.	[Tab A] The invention disclosure form at Tab A discloses two web pages, www.rim.net and www.geocities.com/Athens/Acropolis/4166/framefavs.html [Tabs B/C] Throughout the draft patent application at Tab B, the information pages are referred to as web pages.
28. The method of claim 23, wherein the gateway device stores the information page in a cache and generates the abbreviated version thereof, including the graphical representation and the image map.	[Tabs B/C] Figure 2 of Tab C, along with the associated description at Tab B, shows that the gateway device 24 includes a fetch and cache component 34, and describes the process of the gateway device generating the abbreviated version of the information page along with the associated image map.
29. The method of claim 22, further	[Tab A] The invention disclosure form at Tab A

comprising the steps of: displaying the graphical representation of the information page at the handheld viewing device; selecting a portion of the graphical representation; accessing the image map to determine a frame that corresponds to the portion of the graphical representation selected; and retrieving a graphical representation of the selected frame and displaying it on the handheld viewing device.	describes a method of displaying a graphical representation of a page, selecting a portion of the graphical representation and accessing the image map to retrieve the selected portion of the page. (See, Section 9 of the invention disclosure form, in particular pages 4-12 which describe this exact method.) [Tabs B/C] Figures 3-5 of Tab C, and associated description thereof at Tab B describe these additional method steps in detail.
30. The method of claim 29, further comprising the steps of: providing a uniform resource locator (URL) associated with each of the plurality of frames identified by the image map; and transmitting one of the uniform resource locators to the remote system in response to selecting the portion of the graphical representation.	[Tab A] The invention disclosure form at Tab A indicates that the image map includes "links" to each of the frames in the document. The term "links" is commonly used to refer to URLs in Internet systems. [Tabs B/C] Page 9 of Tab B indicates that an URL is associated with each of the plurality of frames identified by the image map.
31. The method of claim 22, wherein the graphical representation is a bitmap file.	[Tab A] The invention disclosure form at Tab A describes the graphical representation as a bitmap file. (See, for example, Section 2 of the form) [Tab B] Throughout the draft patent application the graphical representation of the requested information page is referenced as a bitmap file.
32. The method of claim 22, further comprising the steps of: if the information page does not include a plurality of frames, then transmitting the information page to the handheld viewing device without abbreviating it into the graphical representation and the image map.	[Tabs B/C] Figure 3 of Tab C, and associated description thereof, shows that if it is determined that the requested information page does not include a plurality of frames (step 56), then the page is transmitted to the handheld device (58), thereby bypassing the abbreviation and image map steps (60).

33. The method of claim 22, further comprising the steps of: prior to the transmitting step, reducing the size of the graphical representation of the information page to match the display characteristics of the handheld viewing device.	[Tab B] The description of Figure 4 set forth in the draft patent application at Tab B describes the step of reducing the size of the graphical representation to match the display characteristics of the viewing device, for example, reducing an 800 x 600 pixel image to a 50 x 40 pixel resolution of the handheld viewing device. (See, page 9 of Tab B)

Conception of the remaining claims 34-50 are supported by the materials at Tabs A, B and C for the same reasons as noted above.

2. From prior to May 18, 2000, until the filing of this patent application on July 24, 2000, I worked with the assignee's inside patent counsel, Mr. Krishna Pathiyal, and the assignee's outside patent counsel, Mr. David Cochran, to review and finalize this patent application. As previously stated, a first draft of the patent application was completed by Mr. Cochran and provided to myself and Mr. Pathiyal prior to May 18, 2000. A copy of this draft patent application is set forth hereto at Tab B, and the drawing figures mentioned in the application are set forth at Tab C. Subsequently, I continued working with Messrs. Pathiyal and Cochran on completing the application. A final version of the application, with edits proposed by myself and Mr. Pathiyal, was sent to Mr. Cochran on July 21, 2000, by Mr. Pathiyal. A copy of this final draft application is set forth hereto at Tab D, including the e-mail showing the date on which Mr. Pathiyal transmitted the application to Mr. Cochran for filing. The application was subsequently filed on July 24, 2000 by Mr. Cochran.

3. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the

United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

By: _____ Date: 10 Mar 2006
Michael Maguire

Invention Disclosure Form

DISCLOSURE DATE:

Reference Number:
TO BE ASSIGNED BY:

THE PURPOSE OF THIS FORM IS TO:

- bring to Krishna Pathiyal's attention the development of ideas that are believed to be novel and of value to RIM;
- provide a description of the Invention that establishes an invention date;
- provide RIM's outside patent counsel with a description of the Invention that facilitates processing of a patent application.

Complete this form by typing the information requested. Submit the completed disclosure form with any additional material requested below to Krishna Pathiyal.

1. TITLE OF INVENTION: Enter a short descriptive phrase that will serve as the title of the Invention.

Graphical Abbreviation of Structured Information for Small Browsers

2. DESCRIPTION OF INVENTION: Enter a brief description of the nature and application of the Invention.

The invention provides a way to conveniently preview content on a browser with a display which is too small to accurately display the entire document in its intended format and layout. On some smaller format devices, it will be impractical to attempt to view a document at a scale which is both readable and which provides a sense of the intended format and layout of the document. The invention consists of initially displaying a bitmap which represents a scaled-down, abbreviated form of what the document actually would have appeared as on a larger browser window on a larger display. The bitmap will allow the user to gather the general gist of how the document was intended to appear. The user will then be able to make a more informed decision as to whether they actually wished to incur the cost and wait of downloading the actual content of the document to their device. In summary, the user will be able to view a graphical abbreviation of what the entire document would have appeared as on a larger browser and choose whether to view the document in detail.

An extremely important application of the invention would be the case of displaying HTML frames on a browser with a display which is too small to accurately display the entire HTML document. On some smaller format devices, it will be impractical to attempt to divide already small screen real-estate into subsections of viewable text. Instead of viewing the whole document with all of its frames, the browser will show the graphical abbreviation of the whole page. The frameset of the document will be apparent to the user in the graphical abbreviation. An initial frame would be selected somehow (perhaps with a rectangle around it) and using the input mechanism available on the device, the user will be able to move the selection to other frames displayed in the graphical abbreviation of the page. The user will be able to select a given frame and indicate her intent to read the HTML document contained in that frame. In summary, the user will be able to view a miniaturized preview of what the entire HTML frameset would have appeared as on a larger browser and choose which of the frames to view in full on the device.

3. Identify the projects and products where the Invention may be incorporated.

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The invention is extremely amenable to any device with a small viewing screen on which one would want to view documents with some formatting structure that cannot be accurately reproduced on a small device. For example, it would be ideal for viewing web pages that contain HTML frames on the BlackBerry.

4. The following dates apply to the Invention:

a) Date marketing began (or is planning to begin) for any products utilizing the Invention: __/__/__.
b) Date RIM shipped (or has plans to ship) any product utilizing the Invention: __/__/__.
c) Date any written material in which the Invention is described, has been (or will be) distributed: 10/06/1999.
d) If the Invention has been described to anyone outside of RIM who has not signed a confidentiality agreement enter date, names, and circumstances surrounding the disclosure:
   Date: __/__/__
   Names:
   Circumstances:
e) If the Invention has been used by anyone outside of RIM enter date, names and circumstances:
   Date: __/__/__
   Names:
   Circumstances:
f) First recorded a description of the Invention 10/06/1999 in email to David Yach presently available on RIM Exchange server.
g) When was a model of the Invention completed: __/__/__.
h) When was a photo of the model taken: __/__/__.
i) Device or system utilizing the Invention first tested on __/__/__ by _____ at _____. Was the test successful? _____

5. Describe the concern of problem your Invention addresses.

Small, portable, wireless devices which can connect to the internet are becoming more and more common. Viewing structured content on these devices can be difficult, as screen real-estate is limited. HTML frames present a special problem, as dividing up the already small screen into sub-areas makes readability even more difficult. The invention attempts to alleviate this problem by providing a convenient mechanism for users to preview a graphical abbreviation of the full document with all its intended structure, and then choose whether to view the document. The invention also provides a mechanism for graphically selecting which sub-area of a document to view.

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6. Identify any devices or systems known to you that address the same concern or problem. (Also include those developed by RIM and any known patents or publications that address the problem (attach copies).

Commercially Available:

Patented devices:

7. Identify the differences between your Invention and each known device or article described above and describe any impact those differences can have in providing value to _____.

8. Identify any other unique aspects of your Invention.

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Other small devices attempt to allow you to view the entire web page, or only allow you to view one of the frames.

9. **Provide a detailed description of your Invention. <u>This is the most important section of the Disclosure Form.</u> Attach as many drawings, circuit diagrams, or other documentation that describes the Invention as possible - apply reference numerals to the various elements of the drawings and use those reference numerals in your detailed description. You must disclose the best mode you know for practicing the Invention. Describe the various elements of the Invention in terms of the function the elements accomplish, and how they cooperate with one another. Point out the important elements and those elements that may be replaced with other known elements. Describe the Invention as you would to another person skilled in your field of expertise.**

The invention would consist of an architecture which would, given a document containing structure, produce an image that would show a rough view – a "graphical abbreviation" – of what the page would appear like when rendered on a larger device.

A first step in the processing would be to load the document in and generate a layout of what the document would appear as if rendered on a larger screen. In this first step, a bitmap would be generated at a size of 640x480 or 800x600 pixels.

The next step of the process would be to reduce this image down to a size displayable on the small device's screen. This step would most likely produce some distortion of the document, but would allow the user to get a general idea for the layout of the document as intended by the document's author.

In the case of a document with sub-areas such as an HTML document with HTML frames, the next step would be to generate an image map to be associated with the bitmap. This image map would define a set of selection areas which would be high-lighted when the user used the selection mechanism on the device to choose which frame to view.

The final steps would be to send this reduced image – in some cases along with the image map information – to the device and to allow the user to chose whether to view the document or whether to view a part of the document.

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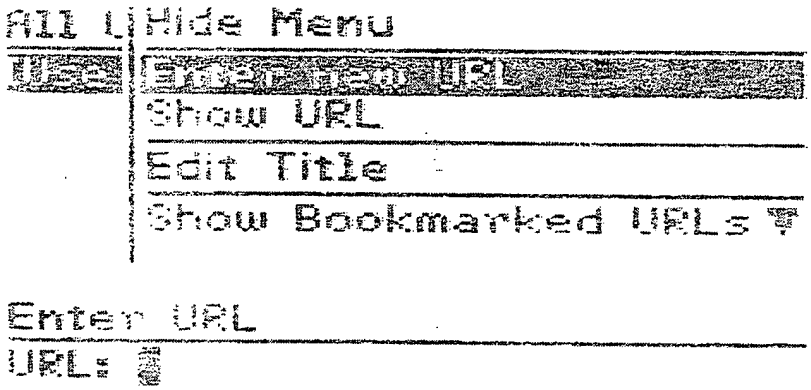
In this way, the original document with its structure will have been transformed into a graphical abbreviation of the document viewable on the device.

As an aside for implementation: We can represent the page to be viewed on the device as an HTML page with an image and a link to the text-only content of the document to be viewed in detail should the user decide to view the document. As well, for the case of a document with subsections, since image maps are standard HTML, one could send the image and associated selection rectangle information as a single, frameless HTML document. In this case we will have transformed a document with structure and possible sub-areas, such a document with HTML frames, into an HTML document without frames, but with an image and possibly an associated image map with links to each of the frames within the original document.

To demonstrate how this invention might work for a user, here we provide a basic flow chart of the steps which a user of a small device might take to view a document that has been graphically abbreviated:

A) The user uses a program on the device to select an URL. This might, for example be through screens such as the ones below:



The URL might then be typed in using some form of keypad or touchscreen. The URL might also be selected by following an embedded link in another web page already displayed.

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The specifics of the actual input mechanism are irrelevant. Of concern here is that the user somehow selects a document they wish to have displayed.

For the sake of example, let us imagine that the user has selected the URL:

http://www.rim.net/

This document, when viewed on a full-sized browser on a PC (in this example using Microsoft Internet Explorer v. 5) might look something like:

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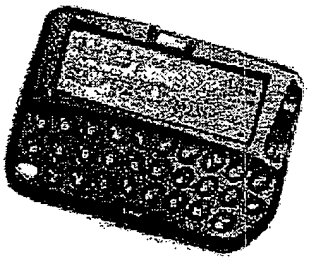
DEVELOPING BREAKTHROUGH WIRELESS SOLUTIONS

BLACKBERRY

RIM is a world leader in the mobile communications market. The current product portfolio includes mobile email solutions, wireless handhelds, two-way pagers, and wireless modems.

RIM is listed on The NASDAQ Stock Market (NASDAQ: RIMM) and The Toronto Stock Exchange (TSE: RIM).

BlackBerry™ is an end-to-end solution developed by RIM. It is the first complete, secure, integrated wireless email solution designed specifically for the mobile professional.



Visit the BlackBerry web site.

InfoWorld 1999 Product of the Year

BlackBerry was selected as "the ultimate mobile computing tool of 1999" by InfoWorld Magazine for providing easy and timely wireless access to email.

Read the full review

More Awards

Upcoming Events

RIM can be found at a variety of conferences and tradeshows across North America. Find out where we'll be next!

RIM and Nortel Networks Form Alliance

January 18, 2000 -- RIM and Nortel Networks have entered into a technology and marketing agreement. More info.

RIM Opens R&D Center In Kanata

December 22, 1999 -- The new R&D center will complement the growing engineering teams at RIM's headquarters in Waterloo.

RIM Supplies BlackBerry to Credit Suisse First Boston

December 21, 1999 -- Over three hundred BlackBerry Handhelds have already been deployed. CSFB plans to continue deploying BlackBerry to additional business units and employees throughout the upcoming year. More info.

Other Recent Press Releases

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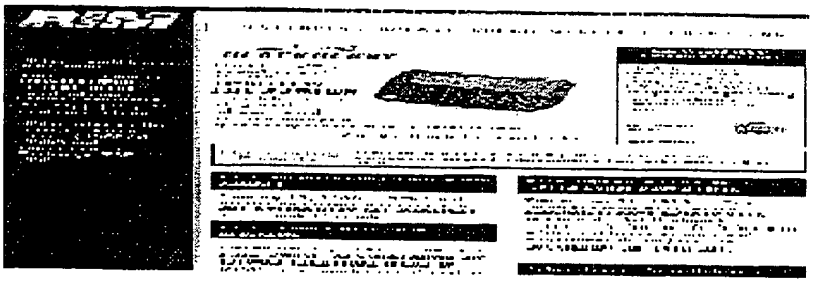
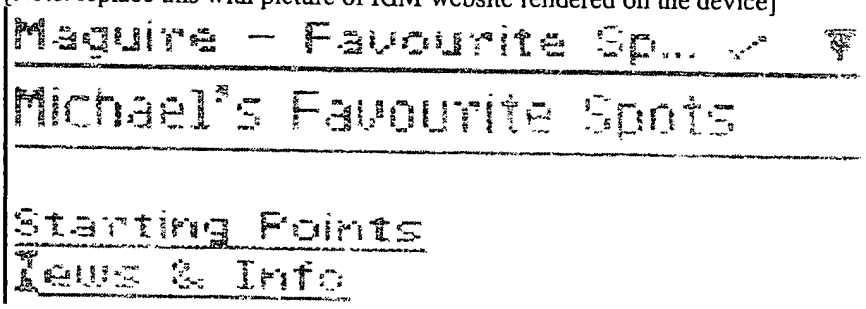
B) The device would then take steps to retrieve the graphically abbreviated version of the document. At this stage the processing would take place to provide a graphical abbreviation of the document which would then be displayed on the device to the user:



C) From this view, the user could then decide whether to view the document, or whether to cancel out of this action.

C1) Should the user choose to view the document, they would indicate this choice via some mechanism on the device, such as, for example, pressing an enter key or e.g. pressing down on a thumbwheel on a device such as the RIM pager. The document would then be rendered in further detail for the user on the device in a manner suitable for reading the document, perhaps, for example, in a text-only mode:

[Note: replace this with picture of RIM website rendered on the device]



C2) If the user chose to not view the document in further detail, they could indicate this choice via some mechanism on the device, such as, for example a cancel or escape key. In this case they would be returned to the previous screen from which they had come.

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As mentioned, a very important special case of this innovation would be the way in which it provides a solution to the problem of viewing content on a small device which contains sub-areas such as HTML frames.

Here we show a flowchart of the steps involved when a user views an HTML page with frames.

A) The user would use some input mechanism (as previously discussed) to select a document to view. For an example, let us suppose the user selects:

http://www.geocities.com/Athens/Acropolis/4166/framefavs.html

Below we see this document as viewed in full-size browser on a large desktop screen.

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starting
points

- Yahoo [Search]
- Four11 Directory Services (SLED)
- Infoseek Guide [Search]
- Lycos [Search]
- Excite
- Virtual Tourist Web Info
- Netfind Search
- W3 Search Engines
- World-Wide Web Servers: Summary
- Canadian WWW Central Index

news
&
info

- The Globe and Mail - this is the best news source I've found
- The Daily News Worldwide - Halifax e-newspaper
- CBC Radio News - faster Swedish Mirror
- CNN
- Canadian Press and Broadcast News
- News from Reuters Online
- Xerox PARC Map Viewer

Michael's Favourite Spots

Starting Points
News & Info
Documentation
Software
Words & Books
Art & Fun
Privacy
Food & Drink
Politics
Academia
Travel
Bizarre
People's Pages
Computer Systems
$$$
Miscellaneous

Michael Maguire

11 Apr 97

Inventor:

Michael Andrew Maguire

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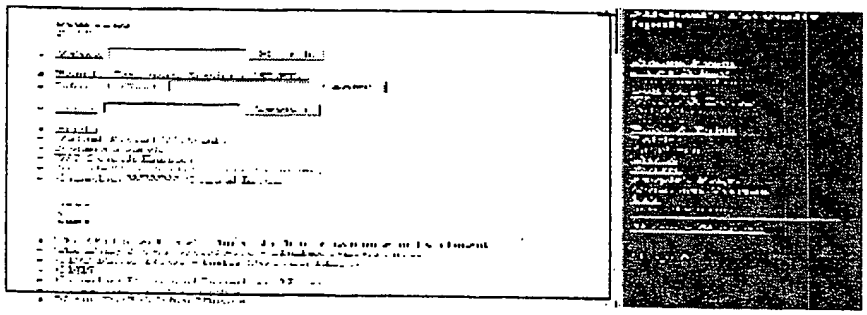
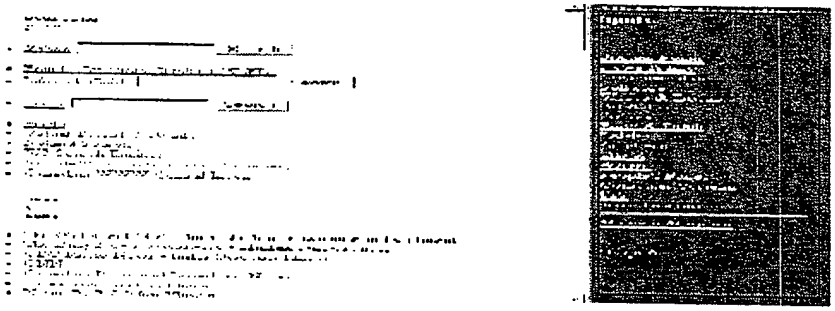
B) The user would then be presented with the graphical abbreviation of the document on the device. Since the document contains sub-areas (frames) one of these sub-areas would be initially selected by default according to some rule. Note that the rule used to decide which frame to initially select could be quite intelligent, somehow deciding which frame the user would be most likely to want to see – perhaps based on size of the sub-area, etc. Here is the HTML page as viewed on small device such as BlackBerry for previewing. Notice the selection of the top left frame via e.g. a rectangle:



C) The user could [optionally] use some input mechanism (thumbwheel, pressing <DOWN> button, etc.) to move selection to another sub-area in the document. Here we see the user changing the selection to the second frame in the document:



D) The user could use an input mechanism (pressing down on thumbwheel, hitting <ENTER> key, etc.) to accept desired frame as one to view and then this frame is displayed on device in greater detail. In this case the user has in fact selected the first frame to view:

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Invention Disclosure Form

DISCLOSURE DATE:

Reference Number:
TO BE ASSIGNED BY:

Maguire - Favourite Sp... ✓ ▼

Michael's Favourite Spots

Starting Points
Jews & Into

Inventor:

Michael Andrew Maguire

FULL NAME (TYPE) | SIGNATURE | Date

This Invention has been witnessed and understood by me:

FULL NAME (TYPE) | SIGNATURE | Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Title of the Invention:

A System and Method for Abbreviating Information Sent to a Viewing Device

Inventor

Michael Maguire

A System and Method for Abbreviating Information Sent to a Viewing Device

BACKGROUND

1. Field of the Invention

The present invention relates to the field of data communication over a network. More particularly, the invention provides a system and method for abbreviating the content and quantity of information sent to the viewing device over a network. The information may be an Internet or Intranet world-wide web (WWW) page with Hypertext Markup Language (HTML) coding, or other types of markup languages that utilize data frames to display information pages. The remote viewing device may be a handheld, laptop, or palmtop device with a limited viewing space for the information being received, and preferably connects to the Internet over a relatively low-bandwidth wireless radio network.

2. Description of the Related Art

Typically, handheld or palmtop devices have very limited viewing surfaces, limited memory capacity, slower processing speeds, and limited user inputs in comparison to large desktop computer systems. These devices may also communicate over a bandwidth-limited data network, such as a wireless packet data network, a cellular network using a digital packet data protocol, or they may use a limited speed modem to download information from a network. For these reasons, it is desirable to limit the data these devices receive over the network or through the modem, particularly when receiving large data files, such as framed web pages that may include text, graphics, animations, multimedia files, or other interactive elements in each frame.

A known method for limiting data transfer to such a viewing device involves restricting the transmittal of graphic information. By providing a specific configuration setting available on most Internet browsers, a user can specify that only text information is fetched by the browser. The graphical portions of the web page are left behind. This

method is indiscriminate, however, and leaves the user with little useful control; simply an on or off switch for changing the type of information viewed. In many cases there are pieces of text that are not desired in the information stream, and pieces of graphics that are desired in the information stream, but the user has no control over this situation. For example, in a framed page, a common frame could provide advertisements or a navigational toolbar. Such frames would not be desirable to a user with limited viewing capability and space.

Another known method for transmitting Internet -type information to a wireless viewing device is to "spoof" the Inter-network Protocol (IP) and Transmission Control Protocol (TCP) so that they partially work over the wireless link. This "spoofing" method, however, often leads to a failure of both the protocols and the device to display all the information.

Alternatively, several attempts have been made at using a wireless proxy to eliminate using both TCP and IP over the wireless network. A wireless proxy is a computer that terminates a TCP/IP connection on one end and a wireless connection on the other end. The most common use of a proxy is as a TCP/IP "firewall," which is used in most companies' networks today. This proxy method removes the TCP/IP protocol from running over the wireless network, but leaves the actual data transferred untouched. This type of proxy has limited ability to further limit the higher-level information being sent to the user, and in particular the bandwidth heavy graphics and multimedia files embedded in most web pages.

Still another known method for limiting information sent to a portable viewing device is to have users pre-define the information sites (e.g., web sites) they intend to access using their portable viewing device. In this method, however, a user must pick, ahead of time, every site to be accessed and must select the information to be transferred

when connecting with the wireless viewer. This selection is typically done on a desktop computer system, where visibility, memory, CPU speed and keyboard input are not restricted. The challenge for the user, however, is to have foreknowledge of every site to be accessed.

In order to reduce the information contained in frames, a prior art method, shown in Fig. 1, reduces the frame content to simple text that includes a hypertext link. The HTML page 10 includes three frames of information, frame A 12, frame B 14, and frame C16. According to this method, page 10 is first loaded into a web proxy server. The proxy server interprets the HTML code of page 10 for frame identifiers, such as the tag <frameset>, which is a brief description of the frame. For example, the tag identifiers could be "Title A" for a first frame 12, "Title B" for a second frame 14, and "Title C" for a third frame 16. An abbreviated page 18 including just the tag identifiers is then sent to the viewing device as simple text with a hypertext link to the frame 12, 14, or 16 that the tag represents. The abbreviated page 18 does not display frame content, but only the tag identifier for each of the frames. Thus, the user has no idea of what information content is included in this framed page.

SUMMARY OF THE INVENTION

A system and method for transporting abbreviated information pages from a gateway device to a handheld viewing device is provided that includes an information source, a gateway device, a relay network and a handheld viewing device. The gateway device includes a fetch and cache component 34, storage 38, and a wireless transport layer 42. The wireless transport layer 42 delivers information from the gateway to the

handheld viewing device. the gateway device determines whether a particular information page requested by the handheld device includes frames, and, if so, then the gateway device creates an abbreviated version of the information page and transmits it to the handheld device. The abbreviated version of the information page includes a reduced-sized bitmap of the page and an image map that identifies the frame regions within the bitmap. The handheld device displays the abbreviated information page, and a user of the device can then manually select certain frames of data through a user interface.

According to one aspect of the invention, a system is provided that includes a source of information, a gateway device, and a handheld viewing device. The gateway device is coupled to the source of information and is configured to control the flow of information from the source of information to the handheld viewing device. The gateway device controls the flow of information by converting the information into a graphical representation, and a map linked to the format of the graphical representation. The handheld device receives the graphical representation and the map, which is then used to display an interactive representation of the information on the handheld device.

According to another aspect of the invention, a method is provided for sending information from an information source to a handheld device over a network by converting the information into an abbreviated graphical representation. According to this method, information is requested through a wireless device coupled to a host device via the network. The requested information is then received at the host device from the information source. The requested information is then rendered into a standard graphical representation. The rendered information is then abbreviated and transmitted from the host device to the wireless device. The abbreviated information is then displayed on the wireless device.

As will be appreciated, the invention is capable of other and different

embodiments, and its several details are capable of modifications in various respects, all without departing from the spirit of the invention. Accordingly, the drawings and description of the preferred embodiment are to be regarded as illustrative in nature and not restrictive.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a prior art abbreviation method for an HTML page;

FIG. 2 is a system diagram of a preferred embodiment of the present invention;

FIG. 3 is a flow diagram of a preferred method for transporting information pages according to the present invention;

FIG. 4 is a flow diagram of the preferred steps for generating an abbreviated information page according to the present invention; and

FIG. 5 shows a graphical display for abbreviating an information page and then interacting with the abbreviated page in order to display one frame in the information page.

DESCRIPTION OF A PREFERRED EMBODIMENT

Turning now to the drawing figures that depict an example of the present invention, FIG. 2 shows a system diagram of a a preferred embodiment of the present invention. A system 20 includes an information source 22, such as a web site coupled to a communication network such as the Internet, a web proxy server 24, a relay network 26, a wireless network 30, and a handheld viewing device 28. The information source 22 could be an Internet site, an Intranet site, or even a local system. The web proxy server 24 is also coupled to the Internet, and communicates information to and from the information sources 22. The relay network 26 couples the web proxy server 24

to the hand held viewing device 28 through a wireless network 30.The viewing device 28 is preferably a wireless handheld device, but could be any other type of device having a limited display screen, such as a cell phone, PDA, laptop, etc.

An example of the handheld device 28 is a BlackBerry™ or Inter@ctive™ two-way Pager manufactured by Research In Motion Limited. This device is further described in co-pending United States application Nos. 09/106,585 and 09/344,432, both titled "Hand Held Messaging Device with Keyboard", and No. 09/455,211, titled, "Apparatus and Method for Dynamically Limiting Information Sent to a viewing Device." Each of these co-pending applications is commonly assigned to the assignee of the present invention, and the disclosure and teachings of these applications is hereby incorporated into this application by reference.

In this system 20, the web site 22 is a repository of the information that the user of the handheld device 28 desires to access for display. The web proxy server 24 is used as a gateway to accept a connection from the relay network 26, and in turn to make a connection to the web site 22 to retrieve the information desired. Preferably, the connection between the web proxy server 24 and the information source 22 is a TCP/IP connection and the information source 22 is a web server containing a plurality of web pages. As is known in the art, a proxy server accepts a connection request from a device and opens another connection on behalf of the device to allow the device to communicate with other devices or systems indirectly. To assist the web proxy server 24 in its task of obtaining information and preparing it for transmission to the handheld device 28, the web proxy server 24 includes a storage area 38. The storage area 38 can be located on the same machine as the web proxy server 24, in another location across a local area network (LAN), or even in a node cluster of fault tolerant storage devices.

Communication across the wireless network connection 30 is facilitated on the handheld device 28 by software operating within the handheld device 28. This software converts requests from the user into signals that are transmitted across the wireless

network connection 30 and understood by the web proxy server 24.

The web proxy server 24 is coupled to, and communicates with the target web site 22 through a Hypertext Transfer Protocol (HTTP) fetch and cache component 34 of the proxy server 24. The target web pages can be located on a range of computers, computer systems, and networks. For example, the information can be stored in local databases, on an Intranet, or on the Internet. The fetch and cache component 34 of the web proxy server 24 stores the web pages that are returned from the information source 22 in response to the user request. A wireless transport layer 42 at the web proxy server 24 then sends the information over the relay network 26, through the wireless network connection 30 to the viewing device 28.

Referring now to Fig. 3, a flow diagram of a preferred method for transporting abbreviated information pages is set forth. The method begins at step 50, where the proxy server 24 waits until a request is received 52 from the viewing device 28. Once a page is requested, the page is then downloaded 54 to the web proxy server 24 using the HTTP fetch and cache component 34, and stored in storage 38. The proxy server 24 searches the HTML code that describes the page for frames in step 56. If the page does not include frames, then at step 58 the page is sent to the viewing device 28 without an abbreviation. If the page does include frames, then the abbreviated frames method 60(described more full below with reference to FIG. 4) is executed to form an abbreviated version of the page and the wireless transport 42 then sends 62 the abbreviated page to the viewing device 28. The proxy server 24 then waits to receive additional page requests from the handheld device 28.

FIG. 4 sets forth the preferred method for generating abbreviated versions of the information pages having frames. The method begins at step 70 where the proxy server 24 renders the page. The process of rendering preferably includes loading the page into

a browser to obtain the placement and proportion of objects, such as frames, as they would appear if loaded to a monitor. Once the page is rendered, then a bitmap is generated at step 72 from the rendered page. Alternatively, other forms of graphical representations could be generated, including compressed forms of representations. The bitmap is a picture version of the rendered page. The bitmap is reduced at step 74 in size from the rendered page to a size that is viewable on the handheld device 28. Such a reduction, could, for example, take a page that would display in 800 x 600 pixel and reduce it to be viewed in 50 x 40 pixel resolution.

The proportions of the frames on the rendered page are known, and this proportion is appropriately scaled on the bitmap in step 76. For instance, if a first frame is sized to be 40% of the width of a page and the full length of the page, the accompanying abbreviated frame on the handheld device 28 would be 40% of the width of the viewable area and the entire length of the viewable area. All frames from the information source 22 are similarly reduced to appropriate proportions of the viewable area of the handheld device 28.

Once the frame areas are determined on the reduced bitmap, then the frame areas are assigned 78 to the reduced bitmap. From the assignment of the frame areas, an image map is generated 80. The image map is a reference between the frame areas and the Universal Resource Locators (URLs) that are assigned to each frame. The image map allows a user to choose a point on the bitmap, and then be able to download the particular URL that is associated with that point on the bitmap. The image map and bitmap are packaged together 82 on the web proxy server 24 and sent through the relay network 26 to the viewing device 28 as shown in step 62 of Fig. 3.

The abbreviated frame method described in Fig. 4 provides the user of the handheld device with a graphical representation of the content of a framed web page. The bit map reduction gives the user perspective to determine if a particular frame contains pertinent content that the user may want to further examine. As shown in Fig.

5, HTML page 100 shows an example framed web page as it would be rendered on a desktop computer system. The HTML page 100 is divided into three frames: frame A 102, frame B 104, and frame C 106. Frame A 102 could, for instance, be a story that the user might want to read while frame B 104 and frame C 106 could be diversionary frames that contain links and advertisements.

The abbreviated frame 110 would show the bitmap representation of the page 100. The image map for the bitmap would have three defined areas: Frame A area 112, frame B area 114, and frame C area 116. These image areas 112-116 are accessible to the user of the viewing device 28 by input means such as a thumbwheel located on the viewing device 28. The input means would toggle between the image areas 112-116 to allow the user to choose a particular frame on which to focus. Once the user has chosen a particular frame, for instance, frame A 102 of the HTML page 100, the viewing device 28 then requests the web page having the URL associated with frame A 102 from the image map of the abbreviated frames page 112. This page is then processed and displayed in the same manner as described in FIGs. 3 and 4.

The invention has been described with reference to preferred embodiments. Those skilled in the art will perceive improvements, changes, and modifications. Such improvements, changes and modifications are intended to be covered by the appended claims.

The following is claimed:

1. A system comprising:
a source of information;
a gateway device coupled to the source of information and configured to control a flow of information from the source of information; and
a handheld device coupled to the gateway device for receiving the information, the gateway device being configured to reduce the information into a graphical representation and a map linked to the graphical representation such that the handheld device receives an abbreviated representation of the information.

2. The system of claim 1, wherein the gateway device comprises:

a Hypertext Transfer Protocol (HTTP) fetch and cache component coupled to the source of information; and

a storage device coupled to the fetch and cache component, configured to store the information.

3. The system of claim 2, wherein the gateway device further comprises a wireless
transport layer coupled between the storage device and the handheld device.

4. The system of claim 2, wherein the gateway device further comprises a wireless delivery methods component coupled between the storage device and the handheld device.

5. The system of claim 1, wherein the source of information is an Internet source.

6. The system of claim 1, wherein the source of information is an Intranet source.

7. The system of claim 1, wherein the handheld device is a PDA.

8. The system of claim 1, wherein the handheld device is a cellular telephone.

9. The system of claim 1, wherein the handheld device is an Internet appliance.

10. The system of claim 1, wherein the handheld device is a two-way pager.

11. A method comprising the steps of:

a) requesting information through a wireless device coupled to a host device;

b) receiving the requested information at the host device from an information source;

c) rendering the requested information;

d) abbreviating the rendered information;

e) transmitting the abbreviated rendered information from the host device to the wireless device; and

f) displaying the abbreviated rendered information data on the wireless device.

12. The method according to claim 8, wherein step (d) includes the steps of:

d1) generating a bitmap of the rendered information;

d2) generating an image map of the rendered information; and

d3) coupling the image map to the bitmap.

13. The method according to claim 11, wherein the information contains framed objects.

ABSTRACT

A system and method for transporting user-requested framed data from a gateway device to a handheld viewing device includes an information source, a gateway device, a relay network and a handheld viewing device. The gateway device includes a fetch and cache component, storage, and a wireless transport layer. The wireless transport layer delivers content from the gateway to the handheld viewing device. The user of the handheld device is then graphically presented with a representative form of the data and is thus able to manually select certain frames of data through a user interface.

STATEMENT OF SERVICES

Please make checks payable and mail to:
THOMAS J. SARNOVSKY
4091 REGAL AVE.
BRUNSWICK, OHIO 44212
PHONE: (330) 225-3297
FAX: (330) 225-3297

MR. THOMAS WOLFE
JONES, DAY, REAVIS & POGUE
901 LAKESIDE AVENUE
CLEVELAND, OHIO 44114

DATE: MAY 12, 2000 JOB NO. 00-133 INVOICE NO: 00083

DESCRIPTION OF SERVICES

PATENT DRAWINGS HTML FRAMES
ABBREVIATIONS, FIGURES 1 THRU 5 ON THREE-
CADD GENERATED A4 SHEETS,
YOUR CAM NO. ~~555255-012-113~~
555255-012-115

TOTAL AMOUNT DUE $ 140.00

ok to pay
David B. Cochran 555255-012-115 6-18-00

TOTAL AMOUNT DUE UPON RECEIPT

THANK YOU FOR ALLOWING US TO SERVE YOUR DRAFTING NEEDS

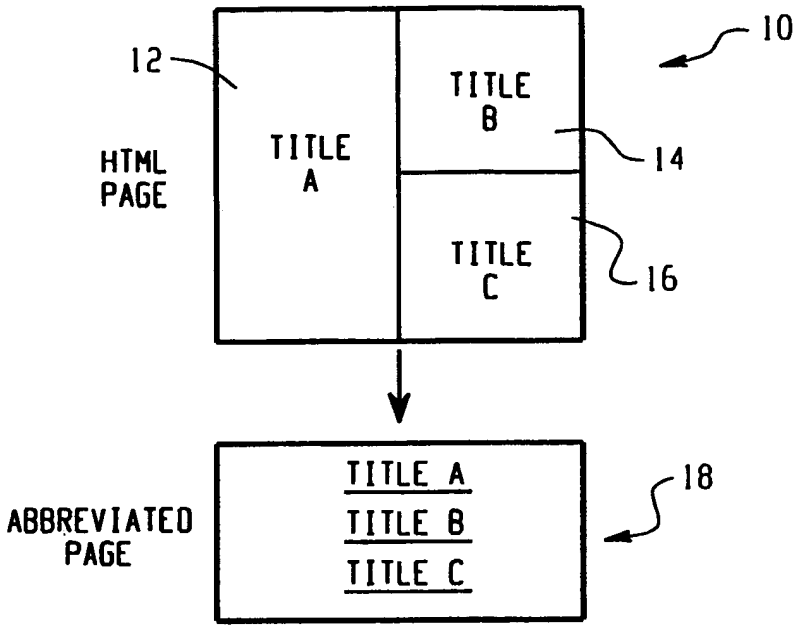

Fig. 1
(PRIOR ART)

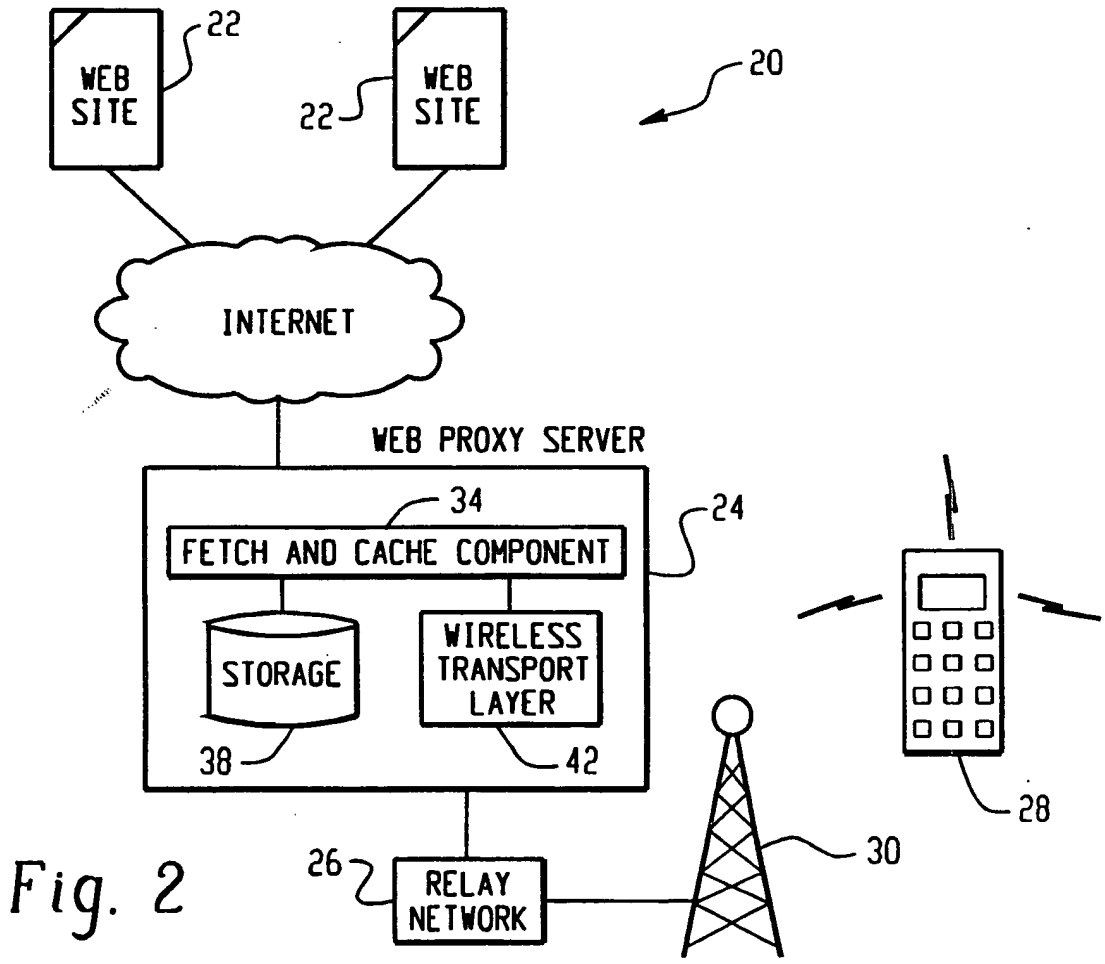

Fig. 2

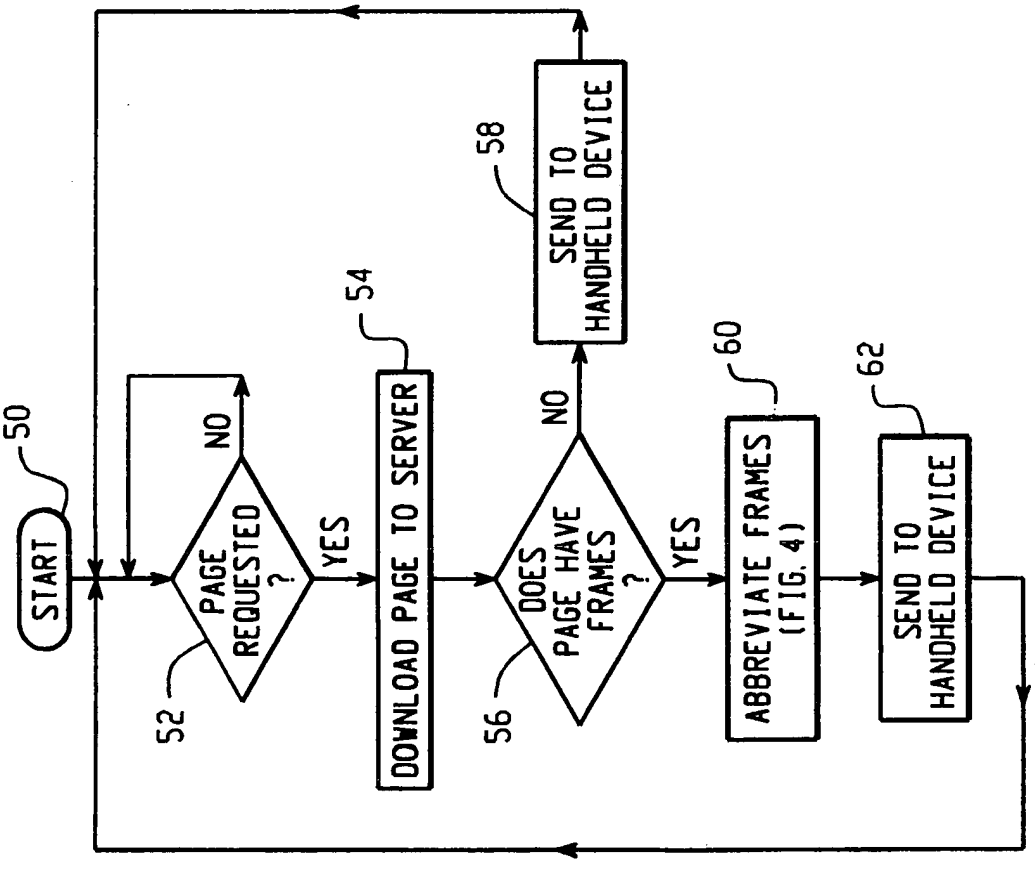
START
50
PAGE REQUESTED ?
52
NO
YES
DOWNLOAD PAGE TO SERVER
54
DOES PAGE HAVE FRAMES ?
56
NO
SEND TO HANDHELD DEVICE
58
YES
ABBREVIATE FRAMES (FIG. 4)
60
SEND TO HANDHELD DEVICE
62

Fig. 3

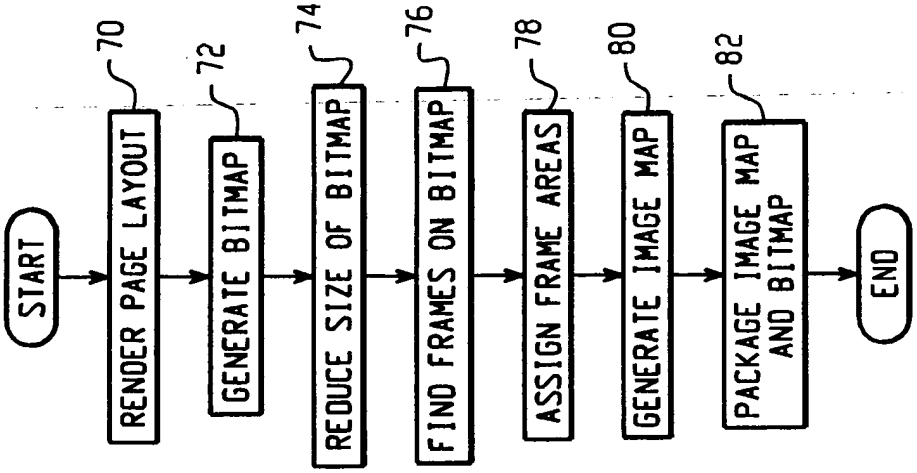
START
RENDER PAGE LAYOUT
70
GENERATE BITMAP
72
REDUCE SIZE OF BITMAP
74
FIND FRAMES ON BITMAP
76
ASSIGN FRAME AREAS
78
GENERATE IMAGE MAP
80
PACKAGE IMAGE MAP AND BITMAP
82
END

Fig. 4

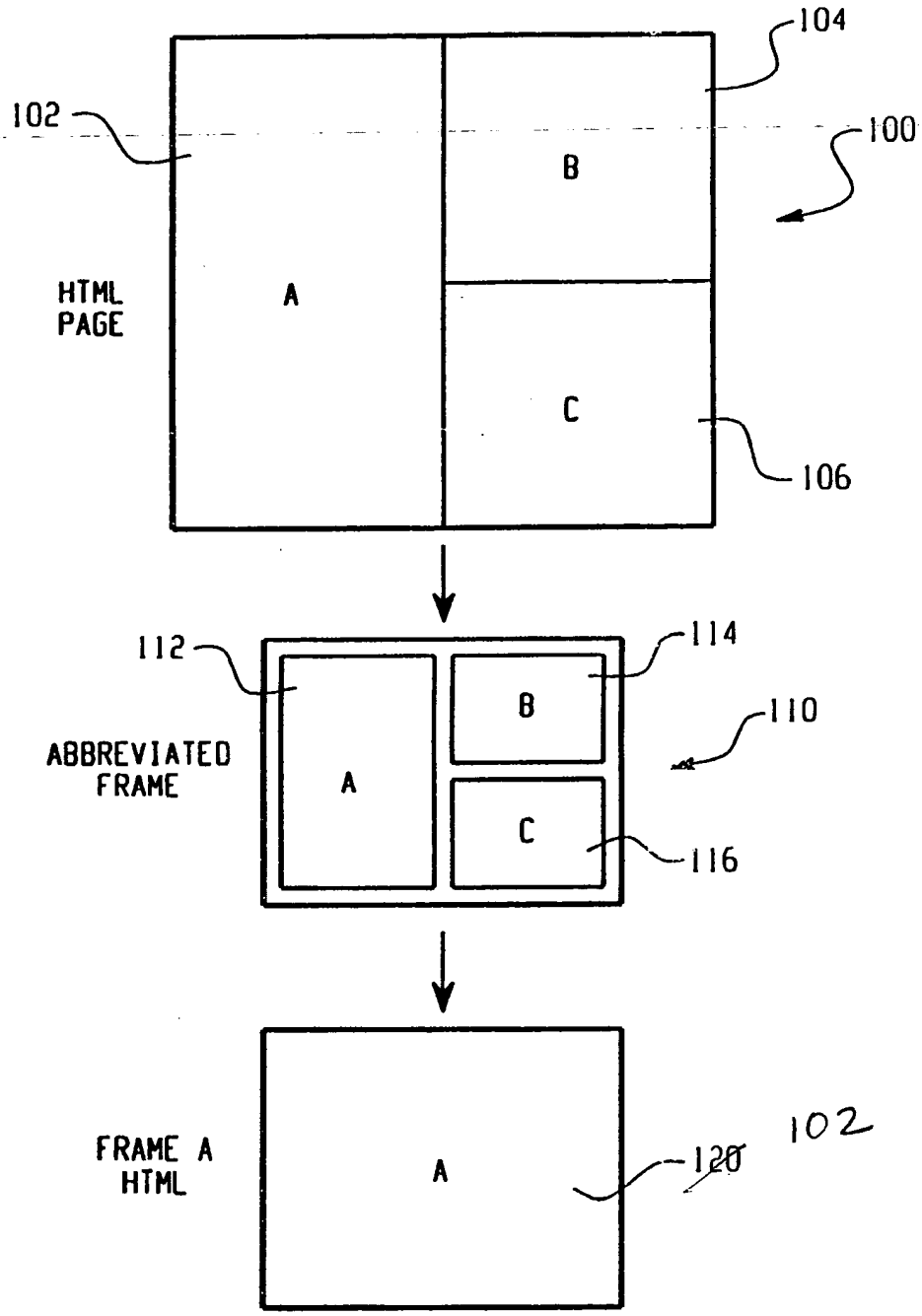
104
102
100
B
HTML
PAGE
A
C
106
112
114
B
110
ABBREVIATED
FRAME
A
C
116
FRAME A
HTML
A
120
102

Fig. 5

Krishna Pathiyal
<kpathiyal@rim.net>

07/21/2000 01:20 PM

To "David B. Cochran (E-mail)" <David_Cochran@jonesday.com>
cc
bcc David Cochran/JonesDay
Subject Patent Application - Graphical abbreviation

Dave

Attached is the final draft of the above-captioned matter. Please file in the USPTO. Thanks
<<abbreviated graphical display.zip>>

With regards,

Krishna K. Pathiyal RIM Confidential / Solicitor-Client Communication

 - abbreviated graphical display.zip

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Title of the Invention:

A System and Method for Abbreviating Information Sent to a Viewing Device

Inventor

Michael Maguire

A System and Method for Abbreviating Information Sent to a Viewing Device

BACKGROUND

1. Field of the Invention

The present invention relates to the field of data communication over a network. More particularly, the invention provides a system and method for abbreviating the content and quantity of information sent to the viewing device over a network. The information may be an Internet or Intranet world-wide web (WWW) page with Hypertext Markup Language (HTML) coding, XML, or other types of markup languages such as WML that utilize data frames to display information pages. The remote viewing device may be a handheld, laptop, or palmtop device with a limited viewing space for the information being received, and preferably connects to the Internet over a relatively low-bandwidth wireless radio network.

2. Description of the Related Art

Typically, handheld or palmtop devices have very limited viewing surfaces, limited memory capacity, slower processing speeds, and limited user inputs in comparison to large desktop computer systems. These devices may also communicate over a bandwidth-limited data network, such as a wireless packet data network, a cellular network using a digital packet data protocol, or they may use a limited speed modem to download information from a network. For these reasons, it is desirable to limit the data these devices receive over the network or through the modem, particularly when receiving large data files, such as framed web pages that may include text, graphics, animations, multimedia files, or other interactive elements in each frame.

A known method for limiting data transfer to such a viewing device involves restricting the transmittal of graphic information. By providing a specific configuration setting available on most Internet browsers, a user can specify that only text information is fetched by the browser. The graphical portions of the web page are left behind. This method is indiscriminate, however, and leaves the user with little useful control; simply an on or off switch for changing the type of information viewed. In many cases there are pieces of text that are not desired in the information stream, and pieces of graphics that are desired in the information stream, but the user has no control over this situation. For example, in a framed page, a common frame could provide advertisements or a navigational toolbar. Such frames would not be desirable to a user with limited viewing capability and space.

Another known method for transmitting Internet -type information to a wireless viewing device is to "spoof" the Inter-network Protocol (IP) and Transmission Control Protocol (TCP) so that they partially work over the wireless link. This "spoofing" method, however, often leads to a failure of both the protocols and the device to display all the information.

Alternatively, several attempts have been made at using a wireless proxy to eliminate using both TCP and IP over the wireless network. A wireless proxy is a computer that terminates a TCP/IP connection on one end and a wireless connection on the other end. The most common use of a proxy is as a TCP/IP "firewall," which is used in most companies' networks today. This proxy method removes the TCP/IP protocol from running over the wireless network, but leaves the actual data transferred untouched. This type of proxy has limited ability to further limit the higher-level information being sent to the user,

and in particular the bandwidth heavy graphics and multimedia files embedded in most web pages.

Still another known method for limiting information sent to a portable viewing device is to have users pre-define the information sites (e.g., web sites) they intend to access using their portable viewing device. In this method, however, a user must pick, ahead of time, every site to be accessed and must select the information to be transferred when connecting with the wireless viewer. This selection is typically done on a desktop computer system, where visibility, memory, CPU speed and keyboard input are not restricted. The challenge for the user, however, is to have foreknowledge of every site to be accessed.

In order to reduce the information contained in frames, a prior art method, shown in Fig. 1, reduces the frame content to simple text that includes a hypertext link. The HTML page 10 includes three frames of information, frame A 12, frame B 14, and frame C16. According to this method, page 10 is first loaded into a web proxy server. The proxy server interprets the HTML code of page 10 for frame identifiers, such as the tag <frameset>, which is a brief description of the frame. For example, the tag identifiers could be "Title A" for a first frame 12, "Title B" for a second frame 14, and "Title C" for a third frame 16. An abbreviated page 18 including just the tag identifiers is then sent to the viewing device as simple text with a hypertext link to the frame 12, 14, or 16 that the tag represents. The abbreviated page 18 does not display frame content, but only the tag identifier for each of the frames. Thus, the user has no idea of what information content is included in this framed page.

SUMMARY OF THE INVENTION

A system and method for transporting abbreviated information pages from a gateway device to a handheld viewing device is provided that includes an information source, a gateway device, a relay network and a handheld viewing device. The gateway device includes a fetch and cache component, storage, and a wireless transport layer. The wireless transport layer delivers information from the gateway to the handheld viewing device. the gateway device determines whether a particular information page requested by the handheld device includes frames, and, if so, then the gateway device creates an abbreviated version of the information page and transmits it to the handheld device. The abbreviated version of the information page includes a reduced-sized bitmap of the page and an image map that identifies the frame regions within the bitmap. The handheld device displays the abbreviated information page, and a user of the device can then manually select certain frames of data through a user interface.

According to one aspect of the invention, a system is provided that includes a source of information, a gateway device, and a handheld viewing device. The gateway device is coupled to the source of information and is configured to control the flow of information from the source of information to the handheld viewing device. The gateway device controls the flow of information by converting the information into a graphical representation, and a map linked to the format of the graphical representation. The handheld device receives the graphical representation and the map, which is then used to display an interactive representation of the information on the handheld device.

According to another aspect of the invention, a method is provided for sending information from an information source to a handheld device over a network by converting the information into an abbreviated graphical representation. According to this method, information is requested through a wireless device coupled to a host device via the network. The requested information is then received at the host device from the information source. The requested information is then rendered into a standard graphical representation. The rendered information is then abbreviated and transmitted from the host device to the wireless device. The abbreviated information is then displayed on the wireless device.

According to the present invention, there is also provided a computer-readable medium containing instructions for transmitting abbreviated rendered information data to be displayed on a wireless device, comprising the instructions for: receiving information through the wireless device coupled to a host device; receiving the requested information at the host device from an information source; rendering the requested information; abbreviating the rendered information; transmitting the abbreviated rendered information from the host device to the wireless device for displaying on the wireless device.

Further according to the present invention, there is also provided a computer-readable medium containing instructions for displaying abbreviated information data on a wireless device, comprising the instructions for: transmitting information through the wireless device coupled to a host device; receiving the requested information in an abbreviated format at the wireless device from the host device; displaying the requested information in an abbreviated format on the wireless device. Further still, the abbreviated format preferably contains a plurality of image areas and the instructions also provide for: toggling, via an input means on the wireless device, between the plurality of image areas to select an image area; transmitting, from the wireless device to the host device, a second

information relating to the selected image area; and, receiving a second requested information at the wireless device from the host device for display on a display screen of the wireless device.

As will be appreciated, the invention is capable of other and different embodiments, and its several details are capable of modifications in various respects, all without departing from the spirit of the invention. Accordingly, the drawings and description of the preferred embodiment are to be regarded as illustrative in nature and not restrictive.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a prior art abbreviation method for an HTML page;

FIG. 2 is a system diagram of a preferred embodiment of the present invention;

FIG. 3 is a flow diagram of a preferred method for transporting information pages according to the present invention;

FIG. 4 is a flow diagram of the preferred steps for generating an abbreviated information page according to the present invention; and

FIG. 5 shows a graphical display for abbreviating an information page and then interacting with the abbreviated page in order to display one frame in the information page.

DESCRIPTION OF A PREFERRED EMBODIMENT

Turning now to the drawing figures that depict an example of the present invention, FIG. 2 shows a system diagram of a ~~a~~ preferred embodiment of the present invention. A system 20 includes an information source 22, such as a web site coupled to a communication network such as the Internet, a web proxy server 24, a relay network 26,

a wireless network 30, and a handheld viewing device 28. The information source 22 could be an Internet site, an Intranet site, or even a local system. The web proxy server 24 is also coupled to the Internet, and communicates information to and from the information sources 22. The relay network 26 couples the web proxy server 24 to the hand held viewing device 28 through a wireless network 30.The viewing device 28 is preferably a wireless handheld device, but could be any other type of device having a limited display screen, such as a cell phone, PDA, laptop, etc.

An example of the handheld device 28 is a BlackBerry™ or Inter@ctive™ two-way Pager manufactured by Research In Motion Limited. This device is further described in co-pending United States application Nos. 09/106,585 and 09/344,432, both titled "Hand Held Messaging Device with Keyboard", and No. 09/455,211, titled, "Apparatus and Method for Dynamically Limiting Information Sent to a viewing Device." Each of these co-pending applications is commonly assigned to the assignee of the present invention, and the disclosure and teachings of these applications is hereby incorporated into this application by reference.

In this system 20, the web site 22 is a repository of the information that the user of the handheld device 28 desires to access for display. The web proxy server 24 is used as a gateway to accept a connection from the relay network 26, and in turn to make a connection to the web site 22 to retrieve the information desired. Preferably, the connection between the web proxy server 24 and the information source 22 is a TCP/IP connection and the information source 22 is a web server containing a plurality of web pages. As is known in the art, a proxy server accepts a connection request from a device and opens another connection on behalf of the device to allow the device to communicate with other devices or systems indirectly. To assist the web proxy server 24 in its task of

obtaining information and preparing it for transmission to the handheld device 28, the web proxy server 24 includes a storage area 38. The storage area 38 can be located on the same machine as the web proxy server 24, in another location across a local area network (LAN), or even in a node cluster of fault tolerant storage devices.

Communication across the wireless network connection 30 is facilitated on the handheld device 28 by software operating within the handheld device 28. This software converts requests from the user into signals that are transmitted across the wireless network connection 30 and understood by the web proxy server 24.

The web proxy server 24 is coupled to, and communicates with the target web site 22 through a Hypertext Transfer Protocol (HTTP) fetch and cache component 36 of the proxy server 24. The target web pages can be located on a range of computers, computer systems, and networks. For example, the information can be stored in local databases, on an Intranet, or on the Internet. The fetch and cache component 34 of the web proxy server 24 stores the web pages that are returned from the information source 22 in response to the user request. A wireless transport layer 40 at the web proxy server 24 then sends the information over the relay network 26, through the wireless network connection 30 to the viewing device 28.

Referring now to Fig. 3, a flow diagram of a preferred method for transporting abbreviated information pages is set forth. The method begins at step 50, where the proxy server 24 waits until a request is received 52 from the viewing device 28. Once a page is requested, the page is then downloaded 54 to the web proxy server 24 using the HTTP fetch and cache component 34, and stored in storage 38. The proxy server 24 searches the HTML code that describes the page for frames in step 56. It is to be understood HTML is only used an example in this description, other markup languages are just as applicable

such as, but not limited to, XML and WML. If the page does not include frames, then at step 58 the page is sent to the viewing device 28 without an abbreviation. If the page does include frames, then the abbreviated frames method 60(described more full below with reference to FIG. 4) is executed to form an abbreviated version of the page and the wireless transport layer then sends 62 the abbreviated page to the viewing device 28. The proxy server 24 then waits to receive additional page requests from the handheld device 28.

FIG. 4 sets ~~forth the~~forth the preferred method for generating abbreviated versions of the information pages having frames. The method begins at step 70 where the proxy server 24 renders the page. The process of rendering preferably includes loading the page into a browser to obtain the placement and proportion of objects, such as frames, as they would appear if loaded to a monitor. Once the page is rendered, then a bitmap is generated at step 72 from the rendered page. Alternatively, other forms of graphical representations could be generated, including compressed forms of representations. The bitmap is a picture version of the rendered page. The bitmap is reduced at step 74 in size from the rendered page to a size that is viewable on the handheld device 28. Such a reduction, could, for example, take a page that would display in 800 x 600 pixel and reduce it to be viewed in 50 x 40 pixel resolution.

The proportions of the frames on the rendered page are known, and this proportion is appropriately scaled on the bitmap in step 76. For instance, if a first frame is sized to be 40% of the width of a page and the full length of the page, the accompanying abbreviated frame on the handheld device 28 would be 40% of the width of the viewable area and the entire length of the viewable area. All frames from the information source 22 are similarly reduced to appropriate proportions of the viewable area of the handheld device 28.

Once the frame areas are determined on the reduced bitmap, then the frame areas are assigned 78 to the reduced bitmap. From the assignment of the frame areas, an image map is generated 80. The image map is a reference between the frame areas and the Universal Resource Locators (URLs) that are assigned to each frame. The image map allows a user to choose a point on the bitmap, and then be able to download the particular URL that is associated with that point on the bitmap. The image map and bitmap are packaged together 82 on the web proxy server 24 and sent through the relay network 26 to the viewing device 28 as shown in step 62 of Fig. 3.

The abbreviated frame method described in Fig. 4 provides the user of the handheld device with a graphical representation of the content of a framed web page. The bit map reduction gives the user perspective to determine if a particular frame contains pertinent content that the user may want to further examine. As shown in Fig. 5, HTML page 100 shows an example framed web page as it would be rendered on a desktop computer system. The HTML page 100 is divided into three frames: frame A 102, frame B 104, and frame C 106. Frame A 102 could, for instance, be a story that the user might want to read while frame B 104 and frame C 106 could be diversionary frames that contain links and advertisements.

The abbreviated frame 110 would show the bitmap representation of the page 100. The image map for the bitmap would have three defined areas: Frame A area 112, frame B area 114, and frame C area 116. These image areas 112-116 are accessible to the user of the viewing device 28 by input means such as a thumbwheel located on the viewing device 28. The input means would toggle between the image areas 112-116 to allow the user to choose a particular frame on which to focus. Once the user has chosen a particular frame, for instance, frame A 102 of the HTML page 100, the viewing device 28 then requests the

web page having the URL associated with frame A 102 from the image map of the abbreviated frames page 112. This selected page is then processed and displayed in the same manner as described in FIGs. 3 and 4. In the event, the selected page does not contain frames, a single page is displayed on the viewing device 28.

The invention has been described with reference to preferred embodiments. Those skilled in the art will perceive improvements, changes, and modifications. Such improvements, changes and modifications are intended to be covered by the appended claims.

The following is claimed:

1. A system comprising:

a source of information;

a gateway device coupled to the source of information and configured to control a flow of information from the source of information; and

a handheld device coupled to the gateway device for receiving the information, the gateway device being configured to reduce the information into a graphical representation and a map linked to the graphical representation such that the handheld device receives an abbreviated representation of the information.

2. The system of claim 1, wherein the gateway device comprises:

a Hypertext Transfer Protocol (HTTP) fetch and cache component coupled to the source of information; and

a storage device coupled to the fetch and cache component, configured to store the information.

3. The system of claim 2, wherein the gateway device further comprises a wireless transport layer coupled between the storage device and the handheld device.

4. The system of claim 2, wherein the gateway device further comprises a wireless delivery methods component coupled between the storage device and the handheld device.

5. The system of claim 1, wherein the source of information is an Internet source.

6. The system of claim 1, wherein the source of information is an Intranet source.

~~13.~~7. The system of claim 1, wherein the handheld device is a PDA.

~~14.~~8. The system of claim 1, wherein the handheld device is a cellular telephone.

~~15.~~9. The system of claim 1, wherein the handheld device is an Internet appliance.

~~16.~~10. The system of claim 1, wherein the handheld device is a two-way pager.

11. A method comprising the steps of:

a) requesting information through a wireless device coupled to a host device;

b) receiving the requested information at the host device from an information source;

c) rendering the requested information;

d) abbreviating the rendered information;

e) transmitting the abbreviated rendered information from the host device to the wireless device; and

f) displaying the abbreviated rendered information data on the wireless device.

12. The method according to claim 8, wherein step (d) includes the steps of:

d1) generating a bitmap of the rendered information;

d2) generating an image map of the rendered information; and

d3) coupling the image map to the bitmap.

13. ~~13.~~ The method according to claim 11, wherein the information contains framed objects.

14. The system of claim 11, wherein the handheld device is a PDA.

15. The system of claim 11, wherein the handheld device is a cellular telephone.

16. The system of claim 11, wherein the handheld device is an Internet appliance.

17. The system of claim 11, wherein the handheld device is a two-way pager.

18. A computer-readable medium containing instructions for transmitting abbreviated rendered information data to be displayed on a wireless device, comprising instructions for:

a) receiving information through the wireless device coupled to a host device;

b) receiving the requested information at the host device from an information source;

c) rendering the requested information;

d) abbreviating the rendered information;

e) transmitting the abbreviated rendered information from the host device to the wireless device for displaying on the wireless device.

19. A computer-readable medium containing instructions for displaying abbreviated information data on a wireless device, comprising instructions for:

a) transmitting information through the wireless device coupled to a host device;

b) receiving the requested information in an abbreviated format at the wireless device from the host device;

c) displaying the requested information in an abbreviated format on the wireless device.

20. A computer-readable medium containing instructions for displaying abbreviated information data on a wireless device as claimed in claim 19, wherein the abbreviated format contains a plurality of image areas.

21. A computer-readable medium containing instructions for displaying abbreviated information data on a wireless device as claimed in claim 20, further contains instructions for:

a) toggling, via an input means on the wireless device, between the plurality of image areas to select an image area;

b) transmitting, from the wireless device to the host device, a second information relating to the selected image area; and,

c) receiving a second requested information relating to the selected image area at the wireless device from the host device.

ABSTRACT

A system and method for transporting user-requested framed data from a gateway device to a handheld viewing device includes an information source, a gateway device, a relay network and a handheld viewing device. The gateway device includes a fetch and cache component, storage, and a wireless transport layer. The wireless transport layer delivers content from the gateway to the handheld viewing device. The user of the handheld device is then graphically presented with a representative form of the data and is thus able to manually select certain frames of data through a user interface.